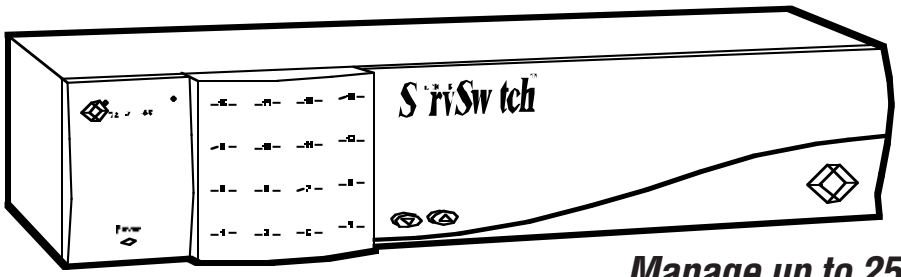
BLACK BOX®
NETWORK SERVICES

ServSwitch



Manage up to 256 CPUs using a single keyboard, mouse, and monitor. Includes on-screen menus for added convenience.

Key Features

- Now with on-screen menus!
- Access up to 256 CPUs with one keyboard, monitor, and mouse.
- Select CPUs from the shared keyboard, the Switch's front panel, a remote PC, or an easy on-screen menu.
- Flash ROM for easy firmware upgrades.
- Compatible with most IBM keyboard, mouse, and video standards.
- Excellent video resolution—up to 1600 x 1280 @ 100 Hz.
- Built-in security.

These ServSwitches are keyboard/video/mouse switches compatible with AT® and PS/2® computer platforms. You can attach as many as 256 CPUs to a set of ServSwitches and use a single shared monitor, keyboard, and mouse to administer them all.

And now you can harness all that power with easy on-screen menus—no commands to remember! For more information, see **About On-Screen Menus** on **page 2**.

You can configure the ServSwitch, scan CPU ports, set and trigger a screen-saver function, set the key-repeat rate for the keyboard, and perform other functions via on-screen menus or by entering simple commands of two to six keystrokes from the shared keyboard. You can also control the switch (but not actually view the CPUs) through the RS-232 port. (As firmware upgrades for the ServSwitch become available, you can connect a PC to this RS-232 port to quickly and easily transmit them to the Switch.)

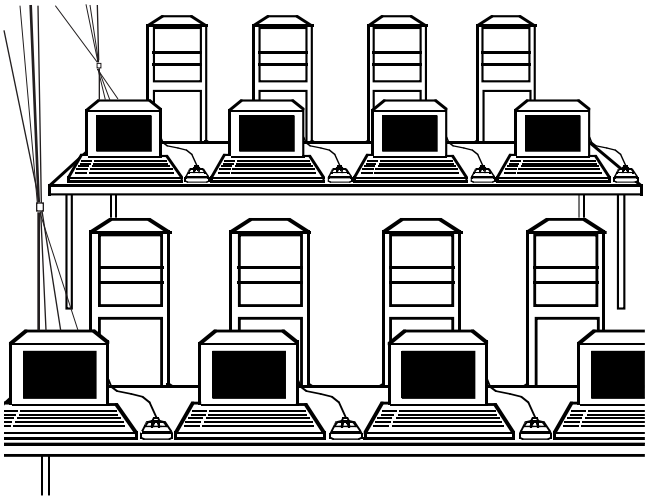
ServSwitches make cable management easy. The monitor/keyboard/mouse station and all CPUs attach to the ServSwitch with special three-way cables that have a single standard DB25 male connector on one end and split out into three connectors at the other end. This means that you only have a single cable to run instead of separate cables for your keyboard, monitor, and mouse. If you need to reorganise CPUs or peripherals, it's a matter of plugging and unplugging single cables rather than three. And these cables can span up to 30.5 m on either side of the switch, so you have plenty of flexibility in your installation.

Each ServSwitch for PC supports VGA and SVGA video; with special cabling, it can also handle XGA and XGA-2. See Additional equipment and Specifications on page 4 for information about video compatibility, screen resolutions, and cabling distances.

Single ServSwitches are available with 2, 4, 8, 12, or 16 CPU ports, in a variety of chassis styles: mini (2-port models), slimline (4- or 8-port models), or full-size (8-, 12-, or 16-port models). You can use ServSwitch-to-ServSwitch Expansion Cable to cascade subsidiary ("sub-master") Serv-type switches to a master ServSwitch in order to control as many as 256 CPUs.

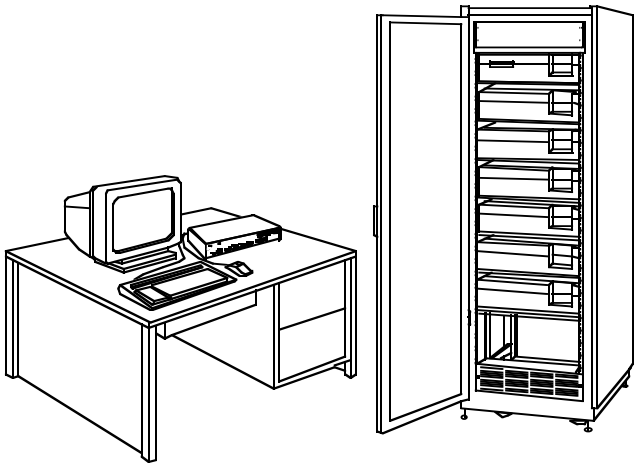
Before the ServSwitch...

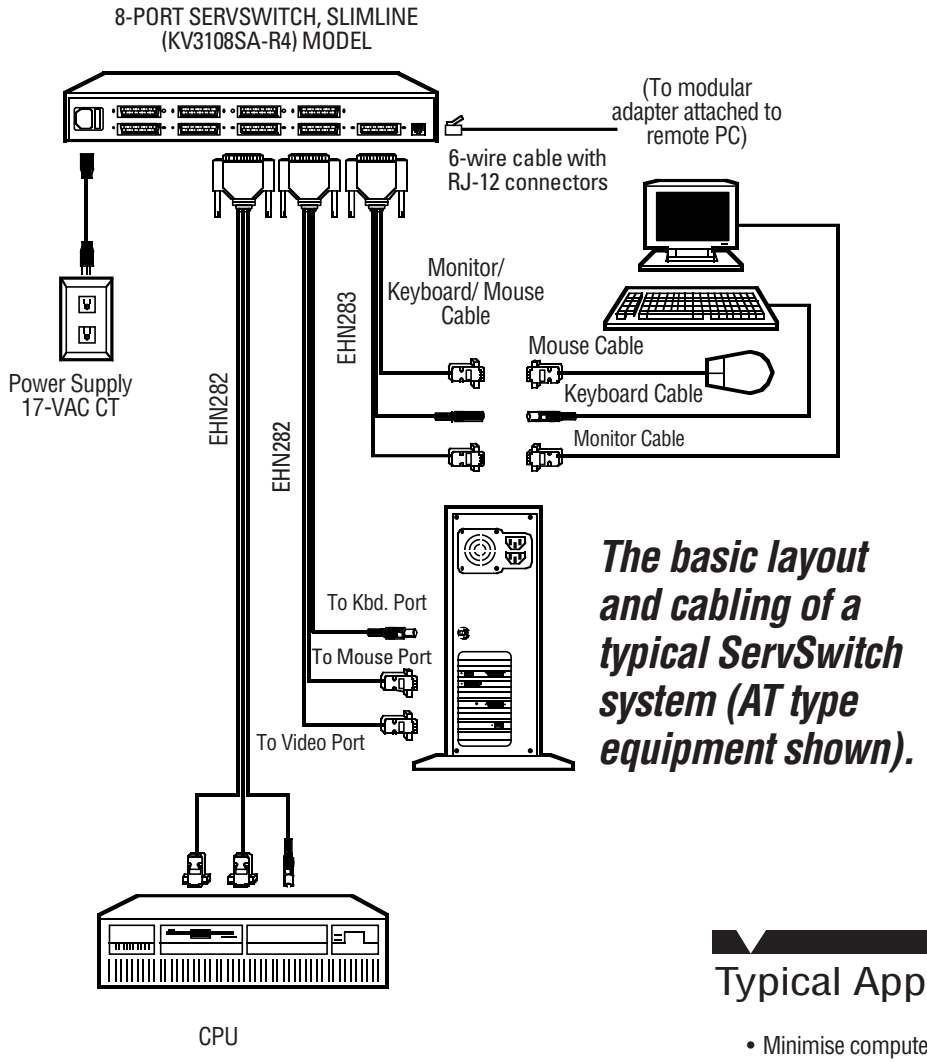
You needed a separate monitor, keyboard, and mouse for each server in the network center. The room was an administrator's nightmare.



After the ServSwitch...

Now you use one station to manage all of the CPUs. There's actually enough free space in the network center to expand the network!





The basic layout and cabling of a typical ServSwitch system (AT type equipment shown).

About on-screen menus

With on-screen menus, a standard feature of the updated ("-R4" model) ServSwitch, you can give each CPU a name that makes sense to you. That makes it easy to identify the server you want and switch to it. Plus, you can easily configure CPU, keyboard, and, mouse types via the on-screen menus.

You can position your on-screen menus anywhere on your computer screen and keep the name of your current server on the screen at all times or for just a few seconds after switching.

Built-in security features keep unwanted users from using the menus to infiltrate your system.

Of course, you don't have to use the menus if you don't want to. You can still control the ServSwitch with front-panel pushbuttons and command sequences from the keyboard.

Typical Applications

- Minimise computer-room clutter—put your servers on a rack and use one shared keyboard, monitor, and mouse to manage them.
- Cascade ServSwitches to administer all of the PCs in a data centre.

Technically Speaking

• The ServSwitch's commands consist of a press and release of the left Control key followed by just a few other keystrokes. Some of the most useful commands are:

– [CTRL] nnn to switch to CPU port number nnn;

– [CTRL] + and [CTRL] – to switch to the next or previous port respectively;

– [CTRL] S and [CTRL] X to turn scanning on and off respectively;

– [CTRL] Tnn to set the scan interval to nn seconds;

– [CTRL] K to save configuration settings to the Switch's NVRAM;

– [CTRL] Mn to set the current CPU port to keyboard mode n;

– [CTRL] N to resynchronize the PS/2 mouse;

– [CTRL] R to reset the keyboard and mouse;

– [CTRL] Pnnn to tell the Switch the total number of CPU ports in the system.

• The ServSwitch is not designed to handle bus-mouse I/O, so it cannot be attached to bus-mouse CPUs, and it cannot be an adequate master unit for submaster ServSwitch BusM units.

• The ServSwitch is not designed to be cascaded with the ServSwitch Multi, the ServSelect, or the ServSwitch Duo. However, ServSwitch can be cascaded with itself, the ServSwitch Ultra, the Matrix ServSwitch, and the ServSwitch Affinity.

• The maximum distance that original Serv cable can be run is 6.1 m end-to-end from the shared peripherals to any CPU. Because some CPUs can drive keyboard and mouse signals farther than that, we offer coaxial cables in lengths up to 30.5 m. (Consult with your CPU manufacturers about this, and note that screen-image quality will decrease with distance.)

• 4-Port Expansion Boards are available if you would like to add CPU ports to a full-size, 8-, or 12-port ServSwitch. Since it's a tricky procedure, we'll install the upgrade for you at no extra charge.

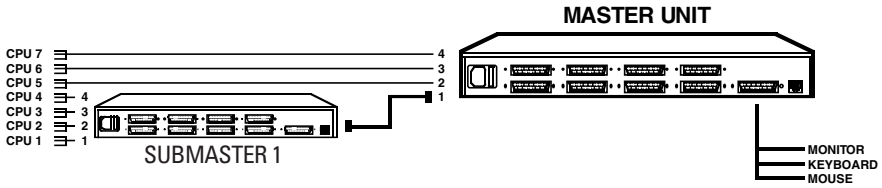
• Specially quoted cables are available if you would like to use an IBM 9515, 9517, or 9518 monitor. Call Tech Support to find out about the custom cables for these products.

• If you would like to mount a 2-port "mini" ServSwitch in a 19", 23", or 24" rack, our product code for the required kit is RMK19M, RMK23M, or RMK24M. The corresponding product code for the 4- or 8-port "slim-line" Switches is RMK19B, RMK23B, or RMK24B, and the code for the 8-, 12-, and 16-port "full-size" ServSwitches is RMK19C, RMK23C, or RMK24C.

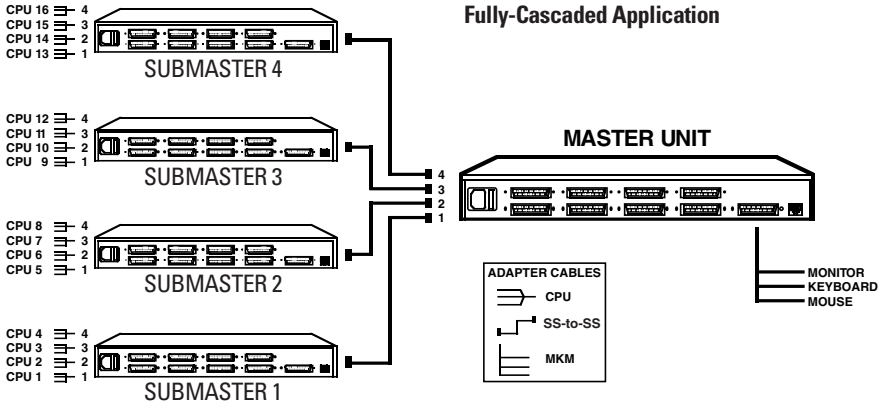
• The ServSwitch is not designed to work with dongles or docking stations. Call Technical Support for information on other products that support these devices.

In properly installed and configured cascaded systems, the master ServSwitch will automatically keep track of where each CPU is.

Partially-Cascaded Application



Fully-Cascaded Application



Specifications

Video Standards — All PC video up to 1600 x 1280 non-interlaced video; Monitor used must support desired video resolution.

Supported CPUs — AT, PS/2®, IBM® PC 286, 386, 486, Pentium® or compatible, and most PC-UNIX boxes (SGI, RS6000, etc.)

Interfaces —
CPU and MONITOR/ KEYBOARD/MOUSE Ports:
Proprietary composite of:
• IBM AT or IBM PS/2 keyboard;
• RS-232 or PS/2 mouse; and
• Video (standards listed above);
RS-232 Port: Proprietary variant of EIA RS-232D, DTE

Resolutions —
With original Serv cabling:
To 1024 x 768 noninterlaced;
With coaxial cabling:
To 1600 x 1280 noninterlaced

Protocol — RS-232: Asynchronous

Data Format —
RS-232: 8 data bits, 1 stop bit, no parity (fixed)

Data Rate —
RS-232: 9600 bps or (for firmware update only) 57,600 bps

Maximum Distance — Depending on the CPU, monitor, and video resolution, either:
- 7.6 m of total original Serv cable from the keyboard, monitor, and mouse to any CPU, including up to 1.5 m from any ServSwitch to any other Serv unit (submaster) attached to it; or
- 6.1 m of coaxial cable—possibly as much as 30.5 m, depending on CPUs—from any ServSwitch to any device attached to it;

Also, 15.2 m of serial cable from any ServSwitch's RS-232 port to a non-local computer (for switching via serial port or upgrading firmware)

Connectors —
All rear-mounted;
2-port models:
(1) 5-pin DIN F: POWER;
(1) RJ-12 (6-wire RJ-11) F: RS-232 (for remote control);
(1) DB25 F: MONITOR/ KEYBOARD/MOUSE;
4-, 8-, 12-, and 16-port models:
(1) IEC 320 M: POWER;
(1) RJ-12 (6-wire RJ-11) F: RS-232 (for remote control);
(1) DB25 F: MONITOR/ KEYBOARD/MOUSE;
2-port models:
(2) DB25 F: CPU;
4-port models:
(4) DB25 F: CPU;
8-port models:
(8) DB25 F: CPU;
12-port models:
(12) DB25 F: CPU;
16-port models:
(16) DB25 F: CPU

User Controls —
- On-screen menus;
- Keyboard commands;
- (3) Pushbuttons: Power, "∂" (switch to next port), and "ƒ" (switch to previous port)

Indicators —
All front-mounted LEDs;
All models: (1) [Unit] POWER;
2-port models:
(2) SELECT, (2) [CPU] POWER;
4-port models:
(4) SELECT, (4) [CPU] POWER;
8-port models:
(8) SELECT, (8) [CPU] POWER;
12-port models:
(12) SELECT, (12) [CPU] POWER;
16-port models:
(16) SELECT, (16) [CPU] POWER

Temperature Tolerance —
0 to 55°C

Humidity Tolerance —
5 to 80% noncondensing

Power — 100 to 240 VAC, 50 to 60 Hz, autosensing; IEC 320 connector with power cord

Size —
Mini Chassis:
4.5H x 22.5W x 12.4D cm
Slim Chassis:
4.5H x 35W x 12.4D cm
Full Chassis:
8.9H x 35W x 12.4D cm

Weight —
Mini Chassis:
1.8 kg
Slim Chassis:
2.4 kg
Full Chassis:
3.7 kg

Additional Equipment You Will Need

- A keyboard and mouse. They must both be of the same platform—AT or PS/2.
- A monitor compatible with all of the CPUs' video cards, capable of syncing to each CPU's video-output frequencies. We recommend that the monitor be able to display a maximum resolution of at least 1024 x 768 (1600 x 1280 is better) at a maximum refresh rate of not less than 75 Hz.
- A Monitor/Keyboard/ Mouse (M/K/M) Adapter Cable to connect the shared monitor, keyboard, and mouse to the ServSwitch.
- CPU Adapter Cables to connect your CPUs to the ServSwitch.

Additional Equipment You Might Need

- ServSwitch-to-ServSwitch Cables (EHN274) for cascading.
- A rackmount kit.
- An RS-232 cable and adapter for remote switching.
- Station Extenders for extra distance.

The Complete Package

- ServSwitch unit.
- Power supply.
- User manual.

Ordering Information

ITEM	CODE
ServSwitch	
2-Port Mini	SW721A-R4
4-Port Slim	SW722A-R4
8-Port Slim	KV3108SA-R4
8-Port Full	SW723A-R4
12-Port Full	SW724A-R4
16-Port Full	SW725A-R4
Monitor/Keyboard/Mouse Adapter Cables for:	
VGA monitor, IBM AT keyboard, serial RS-232 mouse (1-ft. standard)	EHN052-0001
VGA monitor, IBM AT keyboard, serial RS-232 mouse (coaxial)	EHN270-0yyy*
VGA monitor, IBM PS/2 keyboard and mouse (1-ft. standard)	EHN054-0001
VGA monitor, IBM PS/2 keyboard and mouse (coaxial)	EHN283-0yyy*)
CPU Adapter Cables for:	
VGA video output, IBM AT keyboard input, serial RS-232 mouse input (standard)	EHN048-0xxx*
VGA video output, IBM PS/2 keyboard and mouse input (standard)	EHN051-0xxx*
VGA video output, IBM PS/2 keyboard and mouse input (coaxial), with AT and RS-232 adapters	EHN282-0yyy*
ServSwitch-to-ServSwitch Expansion Cable (standard)	EHN055-0001
ServSwitch-to-ServSwitch Expansion Cable (coaxial)	EHN274-0yyy*

*For some cables, variables are shown in place of the last three digits of the product code because the cables come in several stock lengths. For standard CPU adapter cables (those with xxx's), the last three digits can be "005," "010," or "020" for 5-foot (1.5-m), 10-foot (3-m), or 20-foot (6.1-m) cables respectively. For coaxial cables (those with yyy's), these last three digits can be "005," "010," "020," "050," "075," or "100" for 5-foot (1.5-m), 10-foot (3-m), etc., cables respectively. For the Station Extender cable (EHN250-0zzz), the digits can be "050," "100," "150," or "200," for 50-foot (15.2-m), 100-ft. (30.5-m), 150-ft (45.7-m), or 200-ft. (61-m) cables respectively.

<u>To extend the distance to your monitor, keyboard, and mouse or to your CPUs beyond 100 ft. (30.5 m), you will need:</u>

Station Extenders:	
CPU to ServSwitch (RS-232 Mouse)	AC254A
ServSwitch to Station (RS-232 Mouse)	AC255A
CPU to ServSwitch (PS/2 Mouse)	AC257A
ServSwitch to Station (PS/2 Mouse)	AC258A
Station-Extender Cable	EHN250-0zzz*

<u>To mount your ServSwitches, you will need:</u>

Rackmount Kits	
19" Rackmount Kit for mini 2-Port ServSwitch model	RMK19M
23" Rackmount Kit for mini 2-Port ServSwitch model	RMK23M
24" Rackmount Kit for mini 2-Port ServSwitch model	RMK24M
19" Rackmount Kit for slimline 4- and 8-Port ServSwitch models	RMK19B
23" Rackmount Kit for slimline 4- and 8-Port ServSwitch models	RMK23B
24" Rackmount Kit for slimline 4- and 8-Port ServSwitch models	RMK24B
19" Rackmount Kit for full-size 8-, 12-, and 16-Port ServSwitch models	RMK19C
23" Rackmount Kit for full-size 8-, 12-, and 16-Port ServSwitch models	RMK23C
24" Rackmount Kit for full-size 8-, 12-, and 16-Port ServSwitch models	RMK24C